

PATENT

Atty. Dkt. No. SEA/3021

**IN THE CLAIMS:**

Claims 1-16 are pending.

Please cancel claim 16. In addition, please amend claims 1-11 and 13-15, and add new claim 17. The marked-up claims are as follows:

1. (Currently Amended) A method for testing a magnetic disc to be used in a disc drive, the magnetic disc having a plurality of tracks, comprising the steps of;

rotating the magnetic disc;

scanning the magnetic disc along  $n$  radial lines;

storing a sequence of data points representing ~~[[the]]~~ slopes of a plurality of tracks along the  $n$  radial lines~~[[.]]~~;

operating on the stored sets of points to ~~determining~~ determine a measured average slope for each track ~~of the set of tracks in a disc region where roll off is to be determined,~~ around an entire revolution of each track to establish a representative slope for each of the tracks of the plurality of tracks;

taking a radial moving average ~~along a plurality of radial lines on the disc, to~~ establish a sequence of data points, each data point being average for a plurality of the tracks, and each track is represented by its representative slope;

taking a radial derivative ~~along the plurality of radial lines~~ of the sequence of data points on the surface of the disc~~[[.]]~~;

building a curvature profile ~~of the disc from the derivatives along the radial line;~~  
and

comparing said curvature profile to a pre-established limit to determine ~~[[the]]~~ suitability of the disc for use in a disc drive.

2. (Currently Amended) A method as claimed in claim 1, wherein the step of comparing the curvature profile to a pre-established limit comprises the step of comparing the curvature profile to a pre-established profile for an acceptable disc.

## PATENT

Atty. Dkt. No. SEA/3021

3. (Currently Amended) A method as claimed in claim 1, wherein the method of testing is performed on the substrate of ~~[[a]]~~ the magnetic disc.
4. (Currently Amended) A method as claimed in claim 1, wherein the method is performed on an aluminum substrate prior to deposition of any of the recording layers on the magnetic disc.
5. (Currently Amended) A method as claimed in claim 3, wherein the step of determining ~~[[the]]~~ a measured slope ~~[[of]]~~ for each track comprises the steps of:  
calculating a slope at each of a plurality of points along a track around the circumference of the disc; and  
taking [[the] an average of the measured slope calculated slopes at the same circumferential track for each track, using a plurality of points for the track around the circumference of the disc.
6. (Currently Amended) A method as claimed in claim 5, wherein the step of taking ~~a track~~ an average of the calculated slopes for ~~an entire revolution of~~ a track is used to obtain a representative slope of each track, and wherein the track is assumed to represent a constant distance from ~~[[the]]~~ a center of the disc.
7. (Currently Amended) A method as claimed in claim 1, wherein the step of ~~developing~~ taking a radial moving average comprises developing an average over a ~~plurality of discs over a~~ plurality of tracks, *m*, sufficient in number to eliminate spikes from appearing in the differentiation step which is to follow.
8. (Currently Amended) A method as claimed in claim ~~[[8]]~~ 7, wherein:  
the disc drive comprises a read/write head for reading and writing data on a surface of the magnetic disc; and  
the radial length of the radial moving average is smaller than [[the]] a width of  
[[a]] the head which is to be flown over the disc in which the disc is to be used.

## PATENT

Att. Dkt. No. SEA/3021

9. (Currently Amended) A method as claimed in claim 8, ~~including the step of further comprising the steps of:~~

providing a plurality of desirable curvature profiles[[,]] ; and  
assigning each disc to a group around a desired curvature profile.

10. (Currently Amended) A method as claimed in claim 9, wherein the step of providing a plurality of desirable curvature profiles establishes each profile according to ~~[[the]]~~ desired characteristics of ~~[[the]]~~ a head and slider to be used in the disc drive.

11. (Currently Amended) A method for testing a magnetic disc to be used in a disc drive, comprising the steps of:

providing a profilometer,

~~utilizing the profilometer to provide a number of points representing the slope of the disc along a number of tracks near the outer edge of the disc and~~ determine slopes at a plurality of points along a number of radii of the discs disc representing a number of tracks near the outer edge of the disc;

determining an average slope for each track of the disc from the slopes determined at the plurality of points around the circumference of the track;

developing along each of ~~a plurality~~ the number of radii of the disc a series of radial moving averages over the tracks of the discs, each radial moving average comprising a radial length ~~of the radius~~ sufficient to encompass a plurality of tracks, wherein the radial length ~~of each number of tracks~~ is chosen to eliminate spikes from appearing in a differentiation step, ~~and;~~

differentiating the radial ~~data~~ moving averages to establish a radial profile of the disc; ~~and~~

comparing each radial profile to one or more pre-established curvature profiles to establish the utility of the disc in a disc drive having certain operating characteristics.

12. (Original) A method as claimed in claim 11 wherein the steps of the method are performed on a disc substrate.

13. (Currently Amended) A method as claimed in claim 12, wherein:  
the disc drive comprises a read/write head for reading and writing data on a surface of the magnetic disc;

disc drive has operating characteristics represented by a curvature profile to which the curvature profile of the tested disc is matched; and

the radial length of each moving average [[has]] is less than the width of a slider the head to be used in [[a]] the disc drive having the operating characteristics represented by a curvature profile to which the curvature profile of the tested disc is matched.

14. (Currently Amended) A method as claimed in claim 11, wherein the data recorded slopes determined at the plurality of points for each track on the disc comprises the slope angle of each track on the disc moving circumferentially around the disc.

15. (Currently Amended) A method as claimed in claim ~~[[14]]~~13, including further comprising the step of:

comparing the curvature profile of each disc substrate tested to one or more curvature profiles, each said profile representing operating characteristics for a particular disc drive with a particular slider.

16. (Cancelled) Apparatus for testing a plurality of magnetic disc substrates each to be used in a disc drive whose characteristics are represented by a curvature profile comprising a profilometer,

a method for testing a magnetic disc to be used in a disc drive comprising the means for providing a profilometer;

utilizing the profilometer to provide a large number of points representing the slope of the disc along a number of tracks near the outer edge of the disc and along a number of radii of the discs;

determining an average slope for each track of the disc around the entire circumference of the track;

developing along each of a plurality of radii of the disc a series of radial moving averages over the tracks of the discs, each radial moving average comprising a length of the radius sufficient to encompass a plurality of tracks, wherein the radial length is chosen to eliminate spikes from appearing in a differentiation, and means for differentiating the radial data to establish a radial profile of the disc and comparing each radial profile to one or more pre-established profiles to establish the utility of the disc in a disc drive having certain operating characteristics.

17. (New) An apparatus for testing a magnetic disc to be used in a disc drive, the magnetic disc having a plurality of tracks, comprising:

means for scanning the magnetic disc along  $n$  radial lines;

means for storing a sequence of data points representing slopes of a plurality of tracks along the  $n$  radial lines;

means for operating on the stored sets of points to determine a measured slope for each track in a disc region where roll-off is to be determined;

means for taking a radial moving average along a plurality of the  $n$  radial lines on the disc, each radial moving average comprising a radial length sufficient to encompass a plurality of tracks; wherein the radial length is chosen to eliminate spikes from appearing in a differentiation process;

means for taking a radial derivative along the plurality of the  $n$  radial lines on the surface of the disc so as to provide the differentiation process;

means for building a curvature profile from the derivatives along the plurality of the  $n$  radial lines; and

means for comparing said curvature profile to a pre-established limit to determine suitability of the disc for use in a disc drive.